

In the Claims

The following is a marked-up version of the claims with the language that is underlined (“ ”) being added and the language that contains strikethrough (“~~—~~”) being deleted:

1. (Currently Amended) An output stage for a line driver, comprising:
a first amplifier comprising a series combination of a first semiconductor device
and a second semiconductor device;
a second amplifier comprising a series combination of a third semiconductor
device and a fourth semiconductor device;
a first integrated back-matching resistor network interposed between the first and
the second semiconductor devices; and
a second integrated back-matching resistor network interposed between the third
and the fourth semiconductor devices;
wherein a supply voltage applied to a source node of the first and third
semiconductor devices of the first and second amplifiers respectively, is increased to a
voltage level exceeding the maximum drain-source voltage for the semiconductor device
technology associated with the first and third semiconductor devices, resulting in an
available maximum power increase at the line driver output.
2. (Currently Amended) The ~~line driver output stage~~ output stage of claim 1, wherein the
first integrated back-matching resistor network comprises a series combination of

integrated resistors having an additive resistance selected to match an expected load input impedance.

3. (Currently Amended) The ~~line-driver~~ output stage of claim 2, wherein the second integrated back-matching resistor network comprises a series combination of integrated resistors having an additive resistance selected to emulate an expected line input impedance.

4-51. (Cancelled)

52. (Currently Amended) A transmission unit, comprising:
a line driver having an output stage, wherein the output stage is configured to transmit a signal having a peak-to-peak voltage swing that exceeds the maximum drain-source voltage of ~~the~~ integrated circuit technology used to implement the line driver.

53. (Currently Amended) A communications system, comprising:
a transmission unit having an integrated line driver, the integrated line driver having an output stage, wherein the output stage is configured to transmit a signal having a peak-to-peak voltage swing that exceeds the maximum drain-source voltage of ~~the~~ integrated circuit technology used to implement the line driver.

54. (Cancelled)

55. (Currently Amended) ~~The method of claim 54~~ A method of increasing the available signal transmit power on a transmission line, comprising:

applying a transmit signal to an input stage of an integrated line driver;

amplifying the transmit signal such that the output signal swing exceeds the maximum drain-source voltage of integrated circuit technology used to implement an at least one amplifier in an integrated line driver output stage; and

applying the amplified transmit signal via an integrated resistor network to the transmission line, wherein the integrated resistor network comprises:

a parallel combination of a first resistor branch comprising an at least balanced pair of integrated resistors selected to match an expected load impedance.

56. (Currently Amended) The method of claim 54 55, wherein the integrated resistor network comprises:

a pair of integrated back-matching resistors selected such that the sum of their resistance values approximates an expected load impedance, wherein each of the integrated back-matching resistors supplies half of the available signal transmit power to a load.

57. (Currently Amended) ~~The method of claim 54~~ A method of increasing the available signal transmit power on a transmission line, comprising:

applying a transmit signal to an input stage of an integrated line driver;

amplifying the transmit signal such that the output signal swing exceeds the

maximum drain-source voltage of integrated circuit technology used to implement an at
least one amplifier in an integrated line driver output stage; and
applying the amplified transmit signal via an integrated resistor network to the
transmission line.

wherein the step of amplifying the transmit signal is accomplished by adding a plurality of protective semiconductor devices, wherein each of the plurality of protective semiconductor devices protects a corresponding semiconductor device when the corresponding semiconductor device is idle.

58. (Original) The method of claim 57, wherein each of the plurality of protective semiconductor devices comprise at least one source follower.

59. (New) The output stage of claim 1, wherein the available maximum power increase at the line driver output is realizable without increasing the maximum current in the line driver output stage.

60. (New) The output stage of claim 1, wherein the first, second, third, and fourth semiconductor devices are standard CMOS devices.

61. (New) The output stage of claim 60, wherein the first and third semiconductor devices are PMOS transistors.

62. (New) The output stage of claim 60, wherein the second and fourth semiconductor devices are NMOS transistors.
63. (New) The output stage of claim 60, wherein the standard CMOS devices have a maximum drain-source voltage of approximately 5 Volts.
64. (New) The output stage of claim 63, wherein the power supply maximum voltage is approximately 20/3 Volts.
65. (New) The output stage of claim 64, wherein the effective signal swing across a load is approximately 10/3 Volts.
66. (New) The output stage of claim 64, wherein the effective power gain available at the output of the line driver is greater than approximately 2.5 dB larger than the effective power gain of a conventional line driver.
67. (New) The output stage of claim 66, wherein the effective power gain available at the output of the line driver is approximately 3.0 dB larger than the effective power gain of a conventional line driver.